



# Australian Bureau of Statistics

## 6265.0 - Underemployed Workers, Australia, Sep 2007

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## Summary

### Main Features

#### NOTES

#### ABOUT THIS PUBLICATION

This publication presents information about underemployed workers. The number of underemployed workers is an important component of underutilised labour resources in the economy, along with the number of unemployed and some people with marginal attachment to the labour force. Underemployed workers are part-time workers who want, and are available for, more hours of work than they currently have and full-time workers who worked part-time hours during the reference week for economic reasons. A range of information is presented on underemployed workers including the number of hours usually worked, number of preferred hours, steps taken to find work with more hours, and difficulties finding work with more hours.

The statistics in this publication were compiled from the Underemployed Workers Survey, conducted throughout Australia in September 2007 as a supplement to the Australian Bureau of Statistics (ABS) monthly Labour Force Survey (LFS).

Data from the survey relate to all employed people aged 15 years and over. People who worked less than 35 hours in the week prior to the survey (i.e. the reference week) and who would have preferred to work more hours, were asked about whether they were available to start work with more hours, whether they were looking for work with more hours, and their experience in looking for work with more hours. Other information collected included the duration of the current period of insufficient work and the number of extra hours preferred.

#### ROUNDING

As estimates have been rounded, discrepancies may occur between sums of the component items and totals.

#### INQUIRIES

For further information about these and related statistics, contact the National Information

and Referral Service on 1300 135 070 or Labour Market Section on Canberra (02) 6252 7206.

## Summary of Findings

### SUMMARY OF FINDINGS

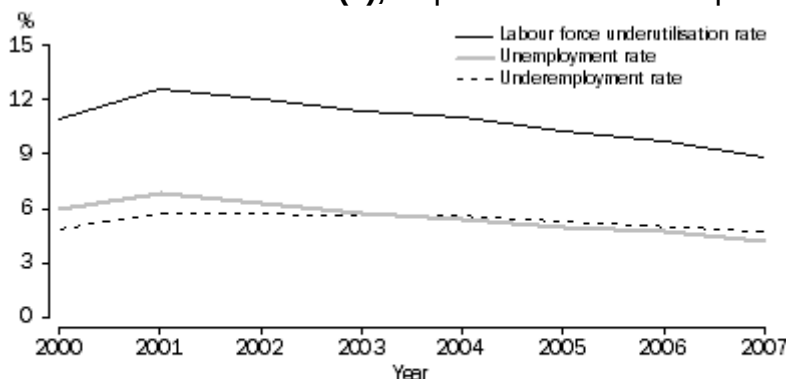
#### OVERVIEW

There were 10,530,000 employed people aged 15 years and over in September 2007. Of these:

- 9,912,000 (94%) were fully employed
- 618,100 (6%) were not fully employed
- 518,300 (5%) were underemployed workers, of these:
  - 472,200 usually worked part-time but would prefer more hours and were available to start work with more hours either in the reference week, or in the four weeks subsequent to the interview
  - 46,200 usually worked full-time but worked part-time hours in the reference week due to economic reasons (being stood down, on short-time, or having insufficient work).

#### LABOUR FORCE UNDERUTILISATION

**Labour underutilisation rates (a), September 2000 to September 2007**



(a) Estimates of unemployed persons and of persons in the labour force used in the calculation of these rates are sourced from the Labour Force Survey.

Underemployed workers are an important component of underutilised labour resources in the economy, capturing a dimension of such resources not available from the unemployment rate alone. In September 2007 the underemployment rate (underemployed workers as a percentage of the total labour force) was 4.7%. When this is combined with the unemployment rate for the same period (4.2%), the result is the labour force underutilisation rate (8.9%). This provides a broader indication of the proportion of the population affected by labour underutilisation. The labour force underutilisation rate has continued to decrease from 12.6% in September 2001 to 8.9% in September 2007.

## PART-TIME WORKERS WHO WOULD PREFER MORE HOURS

In September 2007, there were 2,975,600 part-time workers (2,123,800 women and 851,800 men). There were 571,900 (19%) part-time workers who would prefer to work more hours, consisting of 368,900 women and 203,000 men.

Of the part-time workers who would prefer more hours:

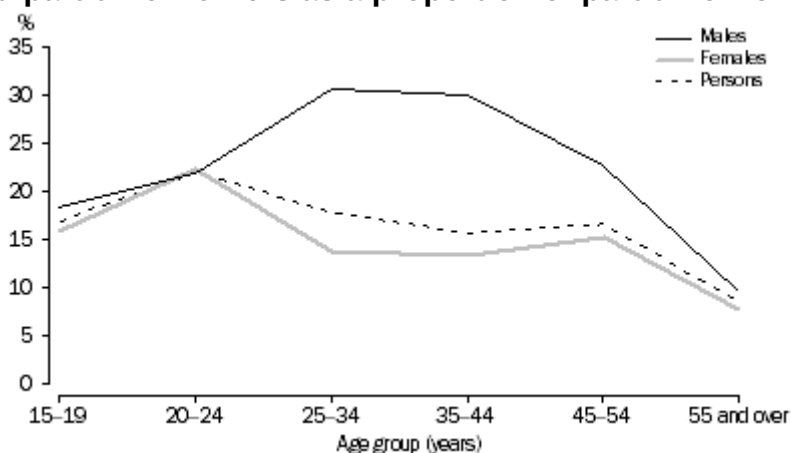
- 33% were aged 15-24 years
- 57% would prefer to work full-time (72% of men and 50% of women)
- 472,200 were available for work with more hours
  - 56% of these were looking for work with more hours
- 99,700 were not available for work with more hours
  - 13% of these were looking for work with more hours.

## UNDEREMPLOYED PART-TIME WORKERS

Underemployed part-time workers are people who usually work less than 35 hours a week, would prefer to work more hours and are available to start work with more hours. These people comprise the majority (91%) of all underemployed workers. In September 2007 there were 472,200 underemployed part-time workers. Of the underemployed part-time workers:

- 64% were women
- 21% were aged 35-44 years
- 17% were aged 15-19 years
- 24% usually work 21-29 hours each week
- 9% usually work 1-5 hours each week
- 26% reported they would move intrastate if offered a suitable job
- 18% reported they would move interstate if offered a suitable job.

### Underemployed part-time workers as a proportion of part-time workers, Age by sex



Part-time workers aged 20-24 years had the highest incidence of underemployment, with 22% of part-time workers in this age group underemployed. The proportion of part-time workers who were underemployed generally decreased with age.

While there were more women underemployed part-time workers than men, the incidence of

underemployment for part-time workers was higher for men (20%) than women (14%) and this was the case in almost all age groups. The largest percentage point difference was for those aged 25-34 years and 35-44 years. In these two age groups, just under one-third (31% and 30%, respectively) of male part-time workers were underemployed, compared to 14% and 13% for women.

### Underemployed part-time workers, Whether would move interstate/intrastate if offered a suitable job - Sex by age

Age group (years)	Whether would move interstate			Whether would move intrastate			Total
	Would move interstate	Would not move interstate	Might/did not know	Would move intrastate	Would not move intrastate	Might/did not know	
	%	%	%	%	%	%	
Males							
15-34	22.4	66.6	10.9	33.2	51.8	15.0	102.1
35-54	21.5	65.6	12.9	32.4	56.7	*10.8	49.2
55 and over	*13.7	75.7	*10.6	*19.8	59.5	*20.8	20.6
Total	21.1	67.4	11.5	31.4	54.1	14.5	171.8
Females							
15-34	21.2	70.3	8.5	28.7	59.1	12.2	135.4
35-54	14.0	79.2	6.7	18.6	69.1	12.3	139.3
55 and over	*8.8	88.6	**2.7	*10.9	82.3	*6.8	25.7
Total	16.8	76.0	7.2	22.5	65.7	11.8	300.3
Persons							
15-34	21.7	68.7	9.5	30.7	55.9	13.4	237.4
35-54	16.0	75.7	8.3	22.2	65.9	11.9	188.5
55 and over	*10.9	82.8	*6.2	14.8	72.2	13.0	46.3
Total	18.4	72.9	8.7	25.7	61.5	12.8	472.2

\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

Generally, more underemployed part-time workers reported that they would move intrastate (26%) than interstate (18%). Men were more likely than women to report that they would move interstate or intrastate if offered a suitable job.

For those aged 15-34 years there was little difference between men and women who reported they would move interstate if offered a suitable job (22% and 21% respectively). However, 22% of men aged 35-54 years reported they would move interstate if offered a suitable job compared to 14% of women in the same age group.

About one-third (31%) of men reported they would move intrastate if offered a suitable job compared to 23% of women. There were higher proportions of men who would move intrastate compared to women in all age groups. Some 32% of men aged 35-54 years would move intrastate compared to 19% of women.

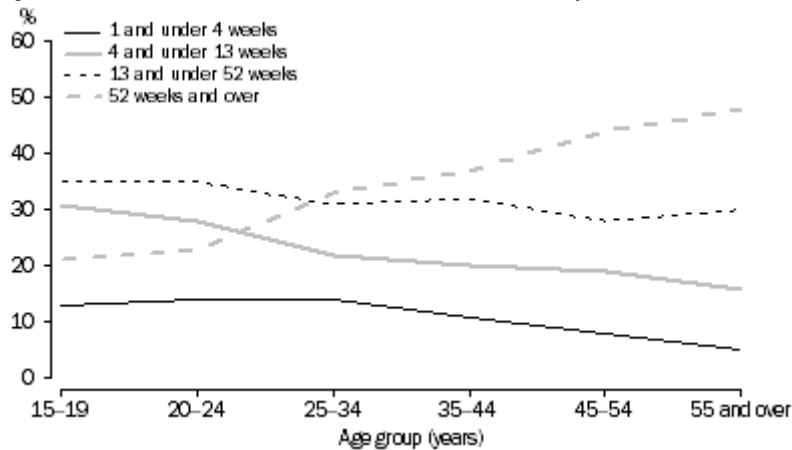
There was a higher proportion of people who reported uncertainty about moving intrastate

than interstate if offered a suitable job (13% of underemployed part-time workers might move or did not know if they would move intrastate compared to 9% for interstate).

**Duration of current period of insufficient work**

Older people generally had a longer period of duration of underemployment than younger people. For example, one fifth (21%) of 15-19 year old underemployed part-time workers had experienced insufficient work for one year or more. In contrast, 44% of those aged 45-54 years, and 48% of those aged 55 years and over had insufficient work for one year or more.

**Underemployed part-time workers, Duration of current period of insufficient work by age**

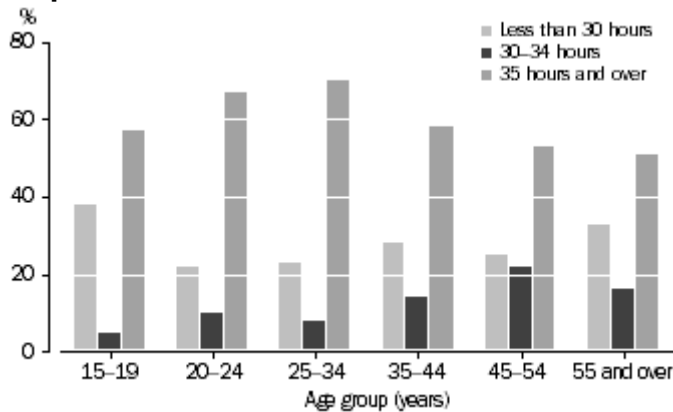


The median duration of the current period of insufficient work for underemployed part-time workers was 26 weeks. For those aged 15-19 years the median duration was 15 weeks and for those aged 55 years and over the median duration was 50 weeks.

**Preferred number of hours**

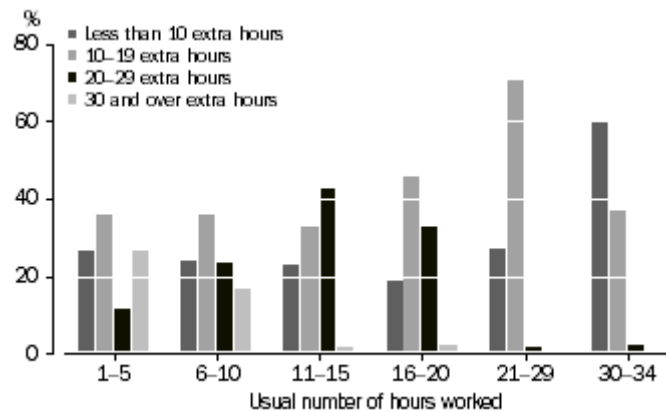
The majority (60%) of underemployed part-time workers would prefer to work a total of 35 hours or more per week. For those aged 25-34 years, 70% preferred a total of 35 hours or more per week, while for those aged 15-19 years, 38% preferred a total of less than 30 hours per week.

**Underemployed part-time workers, Preferred number of total hours by age**



The number of extra hours preferred by part-time workers varied with the number of hours they usually worked. Generally, those usually working fewer hours wanted a greater number of extra hours. However, many of these did not want to work full-time hours. For example, 74% of those who usually worked 1-5 hours a week preferred less than 30 extra hours, and of those who worked 6-10 hours a week, 60% preferred less than 20 extra hours a week.

#### **Underemployed part-time workers, Preferred number of extra hours by usual number of hours worked**



The mean preferred number of extra hours per week for underemployed part-time workers was 14.4 hours. Men preferred to work an average of 16.0 extra hours each week compared with women who preferred to work an average extra 13.5 hours. The mean preferred number of extra hours was lowest for people aged 55 years and over (13.6 hours), and highest for those aged 15-19 years (15.4 hours).

#### **Looking for work with more hours**

Of the 472,200 underemployed part-time workers, 264,900 (56%) had looked for work with more hours at some time during the four weeks up to the end of the reference week. Of the 300,300 underemployed part-time women, just over half (54%) were looking for work with more hours. Whereas of the 171,800 underemployed part-time men, 61% were looking for work with more hours.

The most common step taken by underemployed part-time workers who had looked for work with more hours, was 'contacted prospective employers' (63%). This was followed by 'asked current employer for more work' (57%) and 'looked in newspapers' (54%). The largest percentage point differences between men and women were for 'contacted friends or relatives' (31% of men and 23% of women) and 'contacted prospective employers' (67% of men and 60% of women).

The main difficulty in finding work most commonly reported by underemployed part-time workers who had looked for work with more hours, was 'no vacancies in line of work' (20%). This was followed by 'other difficulties' (13%) and 'unsuitable hours', 'no vacancies at all' and 'no difficulties reported' (each around 9%). The largest percentage point difference between men and women was for 'no vacancies in line of work' (24% of men and 18% of women).

## **UNDEREMPLOYED FULL-TIME WORKERS**

There were 7,554,500 full-time workers in September 2007, accounting for 72% of all employed people. About one in five (1,350,100 or 18%) worked less than 35 hours in the reference week in 2007. About 46,200 of these worked less than 35 hours in the reference week due to economic reasons. Of these:

- 76% were men
- 26% were aged 35-44 years.

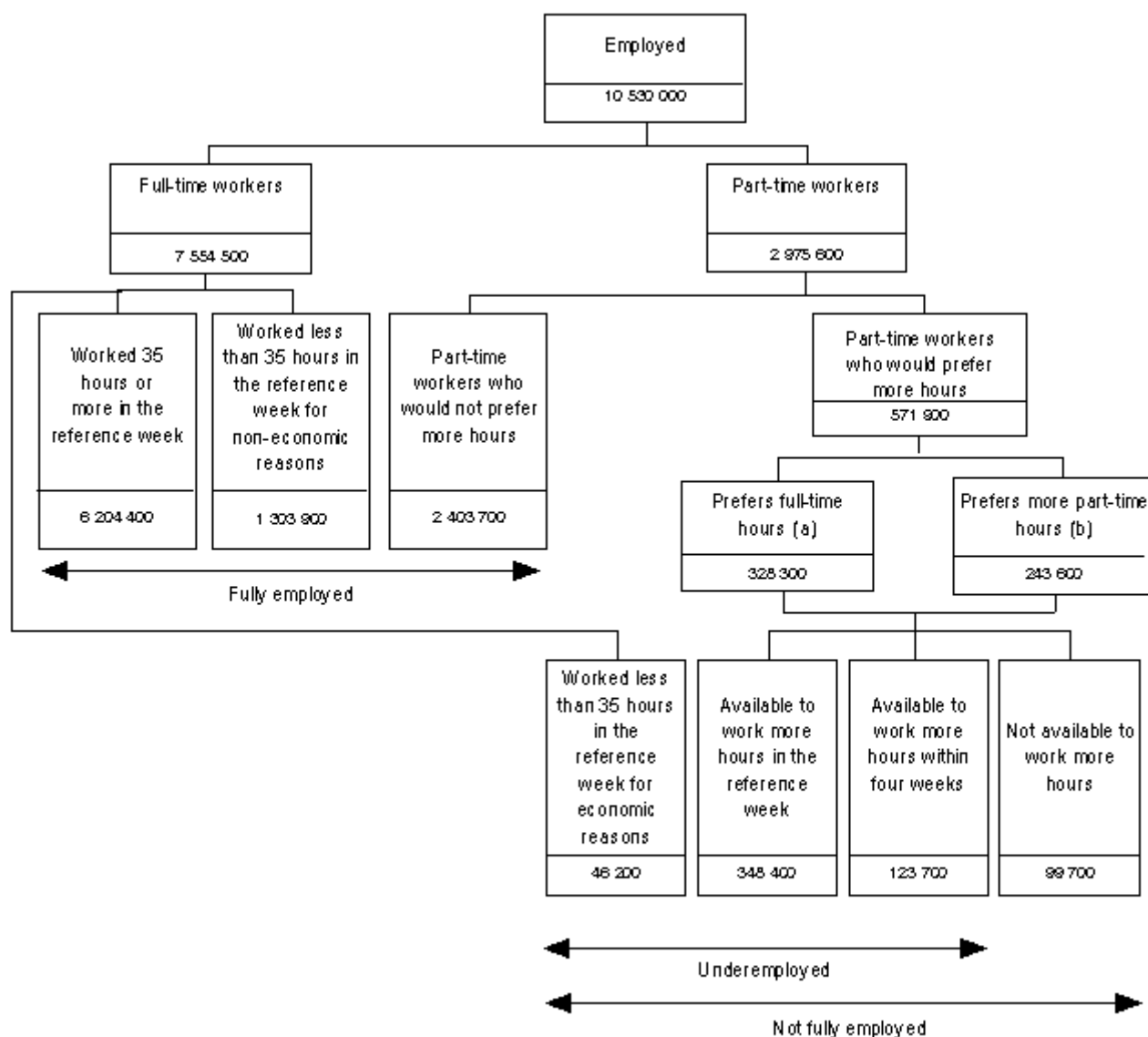
## **Conceptual Framework**

### **CONCEPTUAL FRAMEWORK**

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The ABS conceptual framework for underemployment separates employed people into two mutually exclusive groups:

- workers who are fully employed, comprising:
  - employed people who worked full-time during the reference week (includes people who usually work part-time)
  - employed people who usually work full-time but worked part-time in the reference week for non-economic reasons (including illness or injury, leave, holiday or flextime, and personal reasons)
  - part-time workers (usually work part-time and did so in the reference week) who would not prefer additional hours of work.
- workers who are not fully employed, comprising:
  - part-time workers who would prefer to work more hours
  - full-time workers who worked part-time in the reference week for economic reasons (such as being stood down or insufficient work being available).



(a) Total number of hours preferred to work each week are 35 hours or more.  
 (b) Total number of hours preferred to work each week are between 1 to 34 hours.

The ABS underemployment framework classifies people who are not fully employed into a number of groups. The framework separately identifies part-time workers who would prefer full-time hours and those who would prefer more part-time hours. These people are further classified according to whether they were available to start extra work (either in the reference week or in the four weeks subsequent to the survey).

People who usually work full-time, but worked part-time in the reference week for economic reasons, are separately identified in the underemployment framework. It is assumed that these people would prefer to work full-time in the reference week and would have been available to do so.

## DEFINITION OF UNDEREMPLOYMENT

The ABS definition of underemployment is consistent with the International Labour Organisation (ILO) definition of time-related underemployment adopted in 1998. According to this definition, time-related underemployment exists when the hours of work of an employed person are below a threshold, and are insufficient in relation to an alternative



employment situation in which the person is willing and available to engage. More specifically, people in time-related underemployment comprise all employed people (as defined) who satisfy the following three criteria:

- willingness to work additional hours - want to work more hours than they currently work. The ILO recommends that those who have actively sought to work additional hours should be distinguished from those who have not
- availability to work additional hours, within a specified subsequent period
- worked less than a threshold (determined according to national circumstances) relating to working time - the ABS underemployment framework uses a threshold (35 hours in the reference week) based on the boundary between full-time and part-time work.

## **UNDEREMPLOYED WORKERS SURVEY**

The Underemployed Workers Survey is the primary ABS data source on underemployment. It provides a wide range of information about underemployed workers, including information on the number of hours usually worked, number of preferred hours, steps taken to find work with more hours, and difficulties finding work with more hours. Summary information on underemployed workers is also collected in the Labour Force Survey (LFS) on a quarterly basis.

## **About this Release**

Provides information on visible underemployment. Persons who worked less than 35 hours in the week prior to the survey who would have preferred to work more hours were asked about whether they were looking for work with more hours, available to start work with more hours, and their experience in looking for work with more hours. Other information includes, the duration of the current period of insufficient work, and the number of extra hours preferred. Estimates can be cross-classified by labour force demographics such as State, sex, age, marital status and birthplace.

Data for September 1994 and September 1995 are available as a standard data service (6265.0.40.001).

# **Explanatory Notes**

## **Explanatory Notes**

### **EXPLANATORY NOTES**

#### **INTRODUCTION**

**1** The statistics in this publication were compiled from data collected in the Underemployed Workers Survey conducted throughout Australia in September 2007 as a supplement to the

Australian Bureau of Statistics (ABS) monthly Labour Force Survey (LFS). Respondents to the monthly LFS who fell within the scope of the supplementary survey were asked further questions.

**2** The publication **Labour Force, Australia** (cat. no. 6202.0) contains information about survey design, sample redesign, scope, coverage and population benchmarks relevant to the monthly LFS, which also apply to supplementary surveys. It also contains definitions of demographic and labour force characteristics, and information about telephone interviewing relevant to both the monthly LFS and supplementary surveys.

## **CONCEPTS, SOURCES AND METHODS**

**3** The conceptual framework used in Australia's LFS aligns closely with the standards and guidelines set out in the Resolutions of the International Conference of Labour Statisticians. Descriptions of the underlying concepts and structure of Australia's labour force statistics, and the sources and methods used in compiling these estimates, are presented in **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0.55.001) which is available on the ABS web site <<https://www.abs.gov.au>> (Methods, Classifications, Concepts & Standards).

## **SCOPE**

**4** The scope of the LFS is restricted to people aged 15 years and over and excludes the following people:

- members of the permanent defence forces
- certain diplomatic personnel of overseas governments, customarily excluded from the census and estimated populations
- overseas residents in Australia
- members of non-Australian defence forces (and their dependants).

**5** Students at boarding schools, patients in hospitals, residents of homes (e.g. retirement homes, homes for people with disabilities), and inmates of prisons are excluded from all supplementary surveys.

**6** This supplementary survey was conducted in both urban and rural areas in all states and territories, but excluded approximately 120,000 people living in very remote parts of Australia who would otherwise have been within the scope of the survey. The exclusion of these people will have only a minor impact on any aggregate estimates that are produced for individual states and territories, except the Northern Territory where such people account for around 23% of the population.

## **COVERAGE**

**7** The estimates in this publication relate to people covered by the survey in September 2007. In the LFS, coverage rules are applied which aim to ensure that each person is

associated with only one dwelling and hence has only one chance of selection in the survey. See **Labour Force, Australia** (cat. no. 6202.0) for more details.

## **SAMPLE SIZE**

**8** Supplementary surveys are not always conducted on the full LFS sample. Since August 1994 the sample for supplementary surveys has been restricted to no more than seven-eighths of the LFS sample.

**9** The initial sample for the September LFS consisted of 41,694 private dwelling households and special dwelling units. Of the 33,915 private dwelling households and special dwelling units that remained in the survey after sample loss (e.g. households selected in the survey which had no residents in scope for the LFS, vacant or derelict dwellings and dwellings under construction), approximately 32,106 or 94.7% were fully responding to the Underemployed Workers Survey. The number of completed interviews obtained from these private dwelling households and special dwelling units (after taking into account scope, coverage and subsampling exclusions) was 35,421.

## **RELIABILITY OF THE ESTIMATES**

**10** Estimates in this publication are subject to sampling and non-sampling errors:

- Sampling error is the difference between the published estimate and the value that would have been produced if all dwellings had been included in the survey. For more information see the Technical Note.
- Non-sampling errors are inaccuracies that occur because of imperfections in reporting by respondents and interviewers, and errors made in coding and processing data. These inaccuracies may occur in any enumeration, whether it be a full count or a sample. Every effort is made to reduce the non-sampling error to a minimum by careful design of questionnaires, intensive training and supervision of interviewers, and effective processing procedures.

## **SEASONAL FACTORS**

**11** The estimates are based on information collected in the survey month and, due to seasonal factors, may not be representative of other months of the year.

## **CLASSIFICATIONS USED**

**12** Country of birth data are classified according to the **Standard Australian Classification of Countries (SACC), 1998** (cat. no. 1269.0).

**13** Educational attainment data are classified according to **Australian Standard Classification of Education (ASCED)** (cat. no. 1272.0). See Appendix 1 for more information.

## COMPARABILITY OF TIME SERIES

**14** Revisions are made to population benchmarks for the LFS after each five-yearly Census of Population and Housing. The last such revision was made in February 2004 to take account of the results of the 2001 Census of Population and Housing. Estimates from supplementary surveys conducted from and including February 2004 are based on the revised population benchmarks.

**15** Prior to September 1994, part-time workers who would prefer more hours of work were asked whether they were available to start work with more hours within the subsequent four weeks. From September 1994, an additional question was added to also determine their availability to start work with more hours during the reference week. This question was added to the survey so that estimates of underemployment could be more easily aligned with the then current International Labour Organisation (ILO) recommendations on underemployment.

**16** As part of the redesign in 2001 of the LFS questionnaire, people who were on short-term unpaid leave initiated by the employer, are now classified as employed. This approach is consistent with ILO recommendations on formal job attachment. Analysis of data from the LFS shows that many of these people usually worked part time, and that a number of these had a preference to work more hours. However, overall, these people contribute only marginally to the change in part-time workers who would prefer more hours.

**17** From July 2004, a change has been made to the category 'considered too young or too old by employers' for the items 'all difficulties in finding work with more hours' and 'main difficulty in finding work with more hours'. The category has been split into 'considered too young by employers' and 'considered too old by employers'.

## COMPARABILITY WITH MONTHLY LFS STATISTICS

**18** Due to differences in the scope and sample size of this supplementary survey and that of the monthly LFS, the estimation procedure may lead to some small variations between labour force estimates from this survey and those from the monthly LFS.

## COMPARABILITY WITH ILO DEFINITIONS

**19** Comparability of the concepts and definitions used in the Underemployed Workers Survey are discussed in the Conceptual Framework on page 4. More detailed discussion is included in **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0.55.001), Chapter 5.

## PREVIOUS SURVEYS

**20** The Underemployed Workers Survey was conducted in May 1985, 1988 and 1991. In

1994, the survey became an annual survey, collected each September. Results of previous surveys were published in: **Underemployed Workers, Australia** (cat. no. 6265.0); and the standard data service *Underemployed Workers, Australia* (cat. no. 6265.0.40.001) for 1994 and 1995.

## NEXT SURVEY

**21** The ABS plans to conduct this survey again in September 2008.

## ACKNOWLEDGMENT

**22** ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated: without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the **Census and Statistics Act 1905**.

## RELATED PUBLICATIONS

**23** ABS publications which may be of interest include:

- **Australian Labour Market Statistics** (cat. no. 6105.0)
- **Barriers and Incentives to Labour Force Participation** (cat. no. 6239.0)
- **Job Search Experience, Australia** (cat. no. 6222.0)
- **Labour Force, Australia** (cat. no. 6202.0)
- **Labour Force Experience, Australia** (cat. no. 6206.0)
- **Labour Mobility, Australia** (cat. no. 6209.0)
- **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0.55.001)
- **Persons Not in the Labour Force, Australia** (cat. no. 6220.0)
- **Working Time Arrangements, Australia** (cat. no. 6342.0)

**24** Current publications and other products released by the ABS are available from the Statistics Page on the ABS website. The ABS also issues a daily Release Advice on the web site which details products to be released in the week ahead.

# Glossary

## GLOSSARY

### Available to start work

Refers to people who were available to start work with more hours either in the reference week, or in the four weeks subsequent to the interview.

## **Centrelink**

Centrelink is a statutory authority responsible for delivering a range of Australian government services, including registering of people for job search assistance and income support.

## **Contributing family worker**

A person who works without pay in an economic enterprise operated by a relative.

## **Duration of current period of insufficient work**

For full-time workers who worked less than 35 hours in the reference week due to economic reasons, refers to the number of weeks they have been working less than 35 hours a week.

For part-time workers who would prefer to work more hours, refers to the number of weeks they have been wanting to work more hours.

As periods of insufficient work are recorded in full weeks and rounded down, this results in a slight understatement of duration.

## **Economic reasons**

Economic reasons for full-time workers having worked less than 35 hours in the reference week are:

- there was no work or not enough work available, e.g. due to material shortages
- they were stood down
- they were on short time.

## **Employed**

People aged 15 years and over who, during the reference week:

- worked for one hour or more for pay, profit, commission or payment in kind, in a job or business or on a farm (comprising employees, employers and own account workers); or
- worked for one hour or more without pay in a family business or on a farm (i.e. contributing family workers); or
- were employees who had a job but were not at work and were:
  - away from work for less than four weeks up to the end of the reference week; or
  - away from work for more than four weeks up to the end of the reference week and received pay for some or all of the four-week period to the end of the reference week; or

- away from work as a standard work or shift arrangement; or
- on strike or locked out; or
- on workers' compensation and expected to return to their job; or
- were employers or own account workers who had a job, business or farm, but were not at work.

## **Employee**

A person who works for a public or private employer and receives remuneration in wages, salary, a retainer fee from their employer while working on a commission basis, tips, piece-rates, or payment in kind; or a person who operates his or her own incorporated enterprise with or without hiring employees.

## **Employer**

A person who operates his or her own unincorporated economic enterprise or engages independently in a profession or trade, and hires one or more employees.

## **Full-time workers**

Employed people who usually worked 35 hours or more a week (in all jobs) or others who, although usually worked less than 35 hours a week, worked 35 hours or more during the reference week.

## **Fully employed workers**

Employed people who:

- worked full time during the reference week (including people who usually work part time but worked full time in the reference week); or
- usually work full time but worked less than 35 hours in the reference week for non-economic reasons (such as illness or injury, leave holiday or flextime, or personal reasons); or
- part-time workers who would not prefer to work additional hours.

## **Interstate**

Refers to whether people were prepared to move to another state if offered a suitable job.

## **Intrastate**

Refers to whether people were prepared to move to another part of their state if offered a suitable job.

## **Labour force**

The civilian population aged 15 years and over can be split into two mutually exclusive groups: the labour force (employed and unemployed people) and persons not in the labour force.

## **Labour force underutilisation rate**

The unemployed plus the underemployed, expressed as a percentage of the labour force.

## **Level of highest educational attainment**

Level of highest educational attainment identifies the highest achievement a person has attained in any area of study. It is not a measurement of the relative importance of different fields of study but a ranking of qualifications and other educational attainments regardless of the particular area of study or the type of institution in which the study was undertaken. See Appendix 1 for an explanation of how highest level is derived.

## **Looking for work with more hours**

Looked for work with more hours at some time during the four weeks up to the end of the reference week.

## **Mean duration of insufficient work**

The mean duration of insufficient work is obtained by dividing the aggregate number of weeks a group has had insufficient work by the number of people in that group.

## **Mean preferred number of extra hours**

The mean preferred number of extra hours is obtained by dividing the total preferred number of extra hours reported by a group by the number of people in that group.

## **Median duration of insufficient work**

The median duration of insufficient work is obtained by dividing underemployed workers into two equal groups, one comprising people whose duration of insufficient work is above the mid point, and the other comprising people whose duration is below it.

## **Non-economic reasons**

Non-economic reasons for full-time workers having worked less than 35 hours in the



reference week include:

- holiday, flextime or study leave
- own illness or injury or sick leave
- standard work arrangements, shift work or rostered day(s) off
- on strike, locked out or took part in an industrial dispute
- bad weather or plant breakdown
- began, left or lost job during the reference week
- personal reasons.

### **Not available to start work**

Refers to people who were not available to start work with more hours either in the reference week, or in the four weeks subsequent to the interview.

### **Not fully employed**

People who are not fully employed comprise part-time workers who would prefer to work more hours, and full-time workers who worked part-time hours in the reference week for economic reasons.

### **Own account worker**

A person who operates his or her own unincorporated economic enterprise or engages independently in a profession or trade, and hires no employees.

### **Part-time workers**

Employed people who usually worked less than 35 hours a week (in all jobs) and either did so during the reference week, or were not at work during the reference week.

### **Preferred number of extra hours**

The number of extra hours a week an underemployed worker would have preferred to work.

### **Preferred total number of hours**

The total number of hours per week an underemployed worker would prefer to work.

### **Reference week**

The week preceding the week in which the interview was conducted.

## **Status in employment**

Employed people classified by whether they were employees, employers, own account workers, or contributing family workers.

## **Steps taken to find work with more hours**

All steps taken to find work with more hours during the four weeks up to the end of the reference week.

## **Suitable job**

Job with the preferred number of hours.

## **Underemployed workers**

Underemployed workers are employed people who would prefer, and are available for, more hours of work than they currently have. They comprise:

- part-time workers who would prefer to work more hours and were available to start work with more hours, either in the reference week or in the four weeks subsequent to the survey
- full-time workers who worked part-time hours in the reference week for economic reasons (such as being stood down or insufficient work being available). It is assumed that these people would prefer to work full time in the reference week and would have been available to do so.

## **Underemployment rate**

The number of underemployed workers expressed as a percentage of the labour force.

## **Unemployment rate**

The number of unemployed persons expressed as a percentage of the labour force.

## **Usual number of hours**

The number of hours usually worked in a week.

# **Abbreviations**

## ABBREVIATIONS

The following symbols and abbreviations are used in this publication:

'000	thousand
ABS	Australian Bureau of Statistics
ASCED	Australian Standard Classification of Education
ILO	International Labour Organization
LFS	Labour Force Survey
n.f.d.	not further defined
OMIE	owner manager of incorporated enterprise
RSE	relative standard error
SACC	Standard Australian Classification of Countries
SE	standard error

## Educational Attainment (Appendix)

### APPENDIX 1 EDUCATIONAL ATTAINMENT

#### CLASSIFICATION OF EDUCATION

In 2001, the **ABS Classification of Qualifications (ABSCQ)** (cat. no. 1262.0) was replaced by the **Australian Standard Classification of Education (ASCED)** (cat. no.1272.0). The ASCED is a national standard classification which can be applied to all sectors of the Australian education system including schools, vocational education and training and higher education. ASCED replaces a number of classifications previously used in administrative and statistical systems, including the ABSCQ. The ASCED comprises two classifications: Level of Education and Field of Education.

Level of Highest Educational Attainment can be derived from information on Highest Year of School Completed and Level of Highest Non-school Qualification. The derivation process determines which of the 'non-school' or 'school' attainments will be regarded as the highest. Usually the higher ranking attainment will be self-evident, but in some cases some Secondary Education is regarded, for the purposes of obtaining a single measure, as higher than some Certificate level attainments.

The following decision table is used to determine which of the responses to questions on Highest Year of School Completed (coded to ASCED Broad Level 6) and Level of Highest Non-school Qualification (coded to ASCED Broad Level 5) will be regarded as the highest. It is emphasised that this table was designed for the purpose of obtaining a single value for the output variable Level of Highest Educational Attainment and is not intended to convey any other ordinality.

Decision Table: Level of Highest Educational Attainment							
ASCED LEVEL OF EDUCATION CODES	Certificate n.f.d. (500)	Certificate III or IV n.f.d. (510)	Certificate IV (511)	Certificate III (514)	Certificate I or II n.f.d. (520)	Certificate II (521)	Certificate I (524)
Secondary Education n.f.d. (600)	Certificate n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Certificate I or II n.f.d.	Certificate II	Certificate I
Senior Secondary Education n.f.d. (610)	Senior Secondary n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Senior Secondary n.f.d.	Senior Secondary n.f.d.	Senior Secondary n.f.d.
Year 12 (611)	Year 12	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Year 12	Year 12	Year 12
Year 11 (613)	Year 11	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Year 11	Year 11	Year 11
Junior Secondary Education n.f.d. (620)	Certificate n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Certificate I or II n.f.d.	Certificate II	Certificate I
Year 10 (621)	Year 10	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Year 10	Certificate II	Year 10
Year 9 (622)	Certificate n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Certificate I or II n.f.d.	Certificate II	Certificate I
Year 8 (623)	Certificate n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Certificate I or II n.f.d.	Certificate II	Certificate I
Year 7 (624)	Certificate n.f.d.	Certificate III or IV n.f.d.	Certificate IV	Certificate III	Certificate I or II n.f.d.	Certificate II	Certificate I

The decision table is also used to rank the information provided in a survey about the qualifications and attainments of a single individual. It does not represent any basis for comparison between differing qualifications. For example, a person whose Highest Year of School Completed was Year 12, and whose Level of Highest Non-school Qualification was a Certificate III, would have those responses crosschecked on the decision table and would as a result have their Level of Highest Educational Attainment output as Certificate III. However, if the same person answered 'Certificate' to the highest non-school qualification question, without offering any further detail, it would be crosschecked against Year 12 on the decision table as 'Certificate not further defined'. The output would then be 'Year 12'. The decision table, therefore, does not necessarily imply that one qualification is 'higher' than the other.

## Populations and Data Items List (Appendix)

### APPENDIX 2 POPULATIONS AND DATA ITEMS LIST

#### DATA AVAILABLE ON REQUEST

The ABS has a range of data available on request from the Underemployed Workers Survey. This section lists the data items and populations which relate to the survey. More detailed breakdowns of some data items may also be available on request.

The population(s) for a particular data item refers to the person in the survey to whom the data item relates.

For more information about ABS data available on request, contact Deepa George on Canberra (02) 6252 6149, or by facsimile on (02) 6252 5066, or by email to <deepa.george@abs.gov.au>.

**Population 1:**

Employed persons.

**Population 2:**

Full-time workers.

**Population 3:**

Part-time workers.

**Population 4:**

Part-time workers who would prefer more hours.

**Population 5:**

Part-time workers who would prefer more hours who had been looking for work with more hours or were available to start work with more hours in the reference week or within four weeks.

**Population 6:**

Underemployed part-time workers.

**Population 7:**

Underemployed workers.

Data items	Populations
1 State or territory of usual residence New South Wales Victoria Queensland South Australia Western Australia Tasmania Northern Territory Australian Capital Territory	All
2 Area of usual residence State capital city Balance of state/territory	All
3 Region of usual residence Standard labour force dissemination regions	All
4 Sex Males Females	All
5 Marital status Married Not married	All
6 Relationship in household Family member Husband, wife or partner With dependants Without dependants Lone parent With dependants Without dependants Dependent student	All

	Non-dependent child	
	Other related individual	
	Non-family member	
	Lone person	
	Not living alone	
	Relationship not determined	
7A Country of birth of person and year of arrival in Australia		All
	Born in Australia	
	Born overseas	
	Arrived before 1971	
	Arrived 1971-1980	
	Arrived 1981-1990	
	Arrived 1991-2000	
	Arrived 2001 to survey date	
7B Country of birth		All
	Born in Australia	
	Born overseas	
	Oceania and Antarctica	
	North-West Europe	
	Southern and Eastern Europe	
	North Africa and the Middle East	
	South-East Asia	
	North-East Asia	
	Southern and Central Asia	
	Americas	
	Sub-Saharan Africa	
8 Age group (years)		All
	15-19	
	20-24	
	25,34	
	35-44	
	45-54	
	55-59	
	60-64	
	65-69	
	70 and over	
	Note: Age collected in single years.	
9A Underemployment status		7
	Worked less than 35 hours in the reference week for economic reasons	
	Part-time workers who would prefer more hours who were available to start work with more hours in the reference week or within four weeks	
	Looking and available to start	
	Not looking but available to start	
9B Whether looking and/or available		4-6
	Had been looking for work with more hours	
	Looking and available to start	
	Looking and available in the reference week	
	Looking and not available in the reference week but available within four weeks	
	Looking and not available to start	
	Had not been looking for work with more hours	
	Not looking but available to start	
	Not looking but available in the reference week	
	Not looking and not available in the reference week but available within four weeks	
	Not looking and not available to start	
9C Whether available and/or looking		4-6
	Available to start work with more hours	
	Available in the reference week	
	Looking	
	Not looking	
	Available within four weeks (but not in the reference week)	
	Looking	
	Not looking	
	Not available to start work with more hours	

	Looking	
	Not looking	
10	Full-time or part-time status	All
	Employed persons	
	Full-time workers	
	Worked 35 hours or more in the reference week	
	Worked less than 35 hours in the reference week	
	For non-economic reasons	
	For economic reasons	
	Part-time workers	
	Would not prefer to work more hours	
	Would prefer to work more hours	
	Prefers more part-time hours	
	Prefers full-time hours	
11	Whether fully employed	All
	Fully employed	
	Part-time workers who would prefer more hours and persons who worked less than 35 hours in the reference week for economic reasons	
12	Status in employment	All
	Employees	
	Employers	
	Own account workers	
	Contributing family workers	
13	Number of hours worked in the reference period	4-7
	0-5 hours	
	6-10 hours	
	11-15 hours	
	16-20 hours	
	20-29 hours	
	30-34 hours	
	35 hours and over	
14	Type of insufficient work	4-6
	Full-time	
	Part-time	
15	Duration of current period of insufficient work	4-7
	1 week and under 4 weeks	
	4 weeks and under 13 weeks	
	13 weeks and under 52 weeks	
	52 weeks and over	
16	Level of highest educational attainment	4-7
	Postgraduate Degree	
	Graduate Diploma/Graduate Certificate	
	Bachelor Degree	
	Advanced Diploma/Diploma	
	Certificate III/IV	
	Certificate I/II	
	Certificate not further defined	
	Year 12	
	Year 11	
	Year 10 or below	
	Other education	
	Level not determined	
	No educational attainment	
17	Whether would move interstate if offered a suitable job	4-7
	Would move interstate	
	Would not move interstate	
	Might move interstate	
	Did not know	
18	Whether would move intrastate if offered a suitable job	4-7
	Would move intrastate	
	Would not move intrastate	
	Might move intrastate	
	Did not know	
19	Whether would prefer to change occupation to work more hours	4-7

Would prefer to change occupation	
Would prefer not to change occupation	
No preference	
20 Whether would prefer to change employer to work more hours	4-7
Would prefer to change employer	
Would prefer not to change employer	
No preference	
21 All steps taken to find work with more hours in the last four weeks	4-6
Asked current employer for more work	
Contacted prospective employers	
Registered with Centrelink	
Checked Centrelink touchscreens	
Checked factory noticeboards	
Contacted an employment agency	
Looked in newspapers	
Searched Internet sites	
Answered a newspaper advertisement for a job	
Advertised or tendered for work	
Contacted friends or relatives	
Other steps taken to find work	
Had not been looking for work with more hours	
22 Whether registered with Centrelink	4-6
Registered with Centrelink for job search assistance	
Not registered with Centrelink for job search assistance	
Had not been looking for work with more hours	
23 Preferred number of extra hours	4-6
Less than 10 hours	
10-19 hours	
20-29 hours	
30 hours and over	
24 Main difficulty in finding work with more hours	4-6
Had been looking for work with more hours	
Own ill health or disability	
Considered too young by employers	
Considered too old by employers	
Unsuitable hours	
Too far to travel/transport problems	
Lacked necessary skills or education	
Language difficulties	
Insufficient work experience	
No vacancies in line of work	
Too many applicants for available jobs	
No vacancies at all	
Difficulties with ethnic background	
Difficulties in finding child care	
Other family responsibilities	
Other difficulties	
No difficulties reported	
Had not been looking for work with more hours	
25 Usual number of hours worked	4-6
1-5 hours	
6-10 hours	
11-15 hours	
16-20 hours	
21-29 hours	
30-34 hours	
26 Preferred total number of hours	4-6
Less than 30 hours	
30-34 hours	
35-39 hours	
40 hours and over	
27 Owner manager of incorporated enterprise (OMIE) status	All
Employees (not OMIE)	
Owner managers of incorporated enterprises	
Owner managers of unincorporated enterprises	



## Supplementary Surveys (Appendix)

### APPENDIX 3 SUPPLEMENTARY SURVEYS

#### SUPPLEMENTARY SURVEYS

The Monthly Population Survey program collects data on particular aspects of the labour force. The following is an historical list of supplementary surveys to the monthly labour force surveys. Data from these surveys are available on request and can be obtained by contacting the ABS.

	cat. no.	Frequency	Latest issue
Barriers and Incentives to Labour Force Participation, Australia	6239.0	Biennial	2006-2007
Career Experience, Australia	6254.0	Discontinued	November 2002
Career Paths of Persons with Trade Qualifications, Australia	6243.0	Discontinued	Final issue 1993
Child Care, Australia	4402.0	Irregular	June 2005
Child Employment, Australia	6211.0	Irregular	June 2006
Education and Work, Australia	6227.0	Annual	May 2006
Employee Earnings, Benefits, and Trade Union Membership, Australia	6310.0	Annual	August 2006
Forms of Employment, Australia	6359.0	Irregular	November 2006
Job Search Experience, Australia	6222.0	Annual	July 2007
Labour Force Experience, Australia	6206.0	Biennial	February 2007
Labour Force Status and Educational Attainment, Australia	6235.0	Discontinued	Final issue 1994
Labour Force Status and Other Characteristics of Families, Australia(a)	6224.0	Discontinued	Final issue 2000
Labour Force Status and Other Characteristics of Migrants, Australia	6250.0	Irregular	November 2004
Labour Mobility, Australia	6209.0	Biennial	February 2006
Locations of Work, Australia	6275.0	Irregular	November 2005
Multiple Jobholding, Australia(b)	6216.0	Irregular	August 1997
Participation in Education, Australia	6272.0	Discontinued	Final issue 1999
Persons Not in the Labour Force, Australia	6220.0	Annual	September 2006
Persons Who had Re-entered the Labour Force, Australia	6264.0.40.001	Discontinued	Final issue 1995
Persons Who Have Left the Labour Force, Australia	6267.0.40.001	Discontinued	Final issue 1994
Retirement and Retirement Intentions, Australia	6238.0	Biennial	2006-2007
Retrenchment and Redundancy, Australia	6266.0	Discontinued	July 2001
Successful and Unsuccessful Job Search Experience, Australia	6245.0	Discontinued	Final issue 2000
Superannuation, Australia	6319.0	Discontinued	Final issue 1995
Underemployed Workers, Australia	6265.0	Annual	September 2007
Working Time Arrangements, Australia	6342.0	Irregular	November 2006
Work-Related Injuries, Australia	6324.0	Irregular	2006-2007

(a) Latest data available June 2006, from the ABS website cat. no. 6224.0.55.001 annual, or on request.

(b) Latest data available on request July 2001.

## Quality Declaration - Summary

## QUALITY DECLARATION - SUMMARY

### INSTITUTIONAL ENVIRONMENT

For information on the institutional environment of the Australian Bureau of Statistics (ABS), including the legislative obligations of the ABS, financing and governance arrangements, and mechanisms for scrutiny of ABS operations, please see ABS Institutional Environment.

### RELEVANCE

Underemployed workers are employed people who would prefer, and are available for, more hours of work than they currently have. They comprise:

- part-time workers who would prefer to work more hours and were available to start work with more hours, either in the reference week or in the four weeks subsequent to the survey
- full-time workers who worked part-time hours in the reference week for economic reasons (such as being stood down or insufficient work available). It is assumed that these people would prefer to work full-time in the reference week and would have been available to do so.

The number of underemployed workers contribute to measures of underutilised labour resources.

The Underemployed Workers Survey collects a range of information about underemployed workers, including the number of hours usually worked, number of preferred hours, steps taken to find work with more hours, and difficulties in finding work with more hours.

### TIMELINESS

The Underemployed Workers Survey is conducted annually during September as a supplement to the monthly Labour Force Survey. Results from this survey are released approximately six months after the completion of enumeration (i.e. during February) in the publication, **Underemployed Workers, Australia** (cat. no. 6265.0).

### ACCURACY

Estimates from the Underemployed Workers Survey are subject to sampling and non-sampling errors. Relative standard error (RSE) is a measure of the size of the sampling error affecting an estimate, i.e. the error introduced by basing estimates on a sample of the population rather than the full population. Non-sampling errors are inaccuracies that occur because of imperfections in reporting by respondents and interviewers, and errors made in coding and processing data.

The Underemployed Workers Survey was designed primarily to provide estimates at the Australia level. Broad estimates are available for state and capital city/balance, though users should exercise caution when using estimates at this level because of the presence of high sampling errors. RSEs for all estimates in the publication are available in the Technical Note.

## COHERENCE

The Underemployed Workers Survey is the primary ABS data source on underemployment. Summary information is also collected in the Labour Force Survey on a quarterly basis.

The conceptual framework used for this survey is described in Chapter 5 of **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0.55.001). The statistics in this survey are comparable with other labour statistics produced by the ABS. The ABS definition of underemployment is consistent with the International Labour Organisation definition of time-related underemployment adopted in 1998.

The ABS has been conducting the Underemployed Workers Survey irregularly since 1985, and annually since 1994. Key changes made to the Underemployed Workers Survey since 1994 include:

- Revisions were made to population benchmarks for the Labour Force Survey and supplementary surveys in 2004 to take account of the 2001 Census of Population and Housing. Estimates from supplementary surveys conducted from and including February 2004 are based on the revised benchmarks.
- Changes to improve alignment with recommendations from the International Labour Organisation (ILO) were made in 1994 for underemployment and in 2001 for formal job attachment.

For more information on changes to the survey see Chapter 21.14 of **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0.55.001).

## INTERPRETABILITY

The Underemployed Workers publication contains tables with footnoted data and a Summary of Findings to aid interpretation of the results of the survey. Detailed Explanatory Notes, a Technical Note and a Glossary are also included providing information on the terminology, classifications and other technical aspects associated with these statistics.

Further commentary is often available through articles and data published in other ABS products, including:

- **Australian Labour Market Statistics** (cat. no. 6105.0) - refer to Appendix 2 for past articles.
- **Australian Social Trends** (cat. no. 4102.0) - refer to the Cumulative list of articles for past articles
- **Year Book, Australia** (cat. no. 1301.0) - refer to the 'Work' chapter.

## ACCESSIBILITY

The main product from the survey is a PDF publication, **Underemployed Workers, Australia** (cat. no. 6265.0), released electronically via the ABS website. Additional data may be available on request. For a list of data items available see Appendix 2 of the publication. Note that detailed data can be subject to high relative standard errors, and in some cases, may result in data being confidentialised.

Labour underutilisation measures are published annually in the April issue of **Australian Labour Market Statistics** (cat. no. 6105.0), in **Measures of Australia's Progress: Summary Indicators (Edition 2)** (cat. no. 1383.0.55.001) and have been presented in **Underemployed Workers, Australia** (cat. no. 6265.0) since 2006.

For further information about these or related statistics, contact the National Information and Referral Centre on 1300 135 070 or the Labour Market Section in Canberra on (02) 6252 7206.

## Quality Declaration - Relevance

### EMPLOYED

People aged 15 years and over who, during the reference week:

- worked for one hour or more for pay, profit, commission or payment in kind, in a job or business or on a farm (comprising employees, employers and own account workers); or
- worked for one hour or more without pay in a family business or on a farm (i.e. contributing family workers); or
- were employees who had a job but were not at work and were:
  - away from work for less than four weeks up to the end of the reference week; or
  - away from work for more than four weeks up to the end of the reference week and received pay for some or all of the four-week period to the end of the reference week; or
  - away from work as a standard work or shift arrangement; or
  - on strike or locked out; or
  - on workers' compensation and expected to return to their job; or
- were employers or own account workers who had a job, business or farm, but were not at work.

### FULL-TIME WORKERS

Employed people who usually worked 35 hours or more a week (in all jobs) or others who, although usually worked less than 35 hours a week, worked 35 hours or more during the reference week.

### PART-TIME WORKERS

Employed people who usually worked less than 35 hours a week (in all jobs) and either did so during the reference week, or were not at work during the reference week.

## Data Quality (Technical Note)

### TECHNICAL NOTE DATA QUALITY

# INTRODUCTION

1 Since the estimates in this publication are based on information obtained from occupants of a sample of dwellings, they are subject to sampling variability. That is, they may differ from those estimates that would have been produced if all dwellings had been included in the survey. One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might have varied by chance because only a sample of dwellings was included. There are about two chances in three (67%) that a sample estimate will differ by less than one SE from the number that would have been obtained if all dwellings had been included, and about 19 chances in 20 (95%) that the difference will be less than two SEs. Another measure of the likely difference is the relative standard error (RSE), which is obtained by expressing the SE as a percentage of the estimate.

2 Due to space limitations, it is impractical to print the SE of each estimate in the publication. Instead, a table of SEs is provided to enable readers to determine the SE for an estimate from the size of that estimate (see table T1). The SE table is derived from a mathematical model, referred to as the 'SE model', which is created using data from a number of past Labour Force Surveys. It should be noted that the SE model only gives an approximate value for the SE for any particular estimate, since there is some minor variation between SEs for different estimates of the same size.

# CALCULATION OF STANDARD ERROR

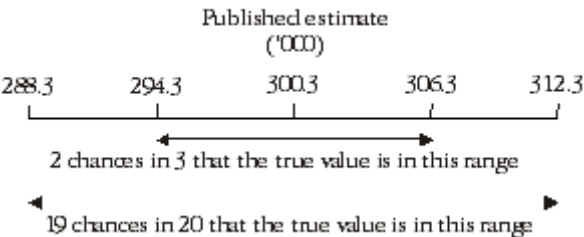
3 An example of the calculation and the use of SEs in relation to estimates of persons is as follows. Table 5 shows the estimated number of female underemployed part-time workers was 300,300. Since this estimate is between 300,000 and 500,000, table T1 shows that the SE for Australia will lie between 5,950 and 7,500 and can be approximated by interpolation using the following general formula:

*SE of estimate*

$$= \text{lower SE} + \left( \left( \frac{\text{size of estimate} - \text{lower estimate}}{\text{upper estimate} - \text{lower estimate}} \right) \times (\text{upper SE} - \text{lower SE}) \right)$$
$$= 5,950 + \left( \left( \frac{300,300 - 300,000}{500,000 - 300,000} \right) \times (7,500 - 5,950) \right)$$

= 6,000 (rounded to the nearest 100)

4 Therefore, there are about two chances in three that the value that would have been produced if all dwellings had been included in the survey will fall within the range 294,300 to 306,300 and about 19 chances in 20 that the value will fall within the range 288,300 to 312,300. This example is illustrated in the following diagram.



**5** In general, the size of the SE increases as the size of the estimate increases. Conversely, the RSE decreases as the size of the estimate increases. Very small estimates are thus subject to such high RSEs that their value for most practical purposes is unreliable. In the tables in this publication, only estimates with RSEs of 25% or less are considered reliable for most purposes. Estimates with RSEs greater than 25% but less than or equal to 50% are preceded by an asterisk (e.g.\*3.2) to indicate they are subject to high SEs and should be used with caution. Estimates with RSEs of greater than 50%, preceded by a double asterisk (e.g.\*\*0.3), are considered too unreliable for general use and should only be used to aggregate with other estimates to provide derived estimates with RSEs of less than 25%.

## MEANS AND MEDIANS

**6** The RSEs of estimates of mean duration of insufficient work, median duration of insufficient work and mean preferred number of extra hours are obtained by first finding the RSE of the estimate of the total number of persons contributing to the mean or median (see table T1) and then multiplying the resulting number by the following factors:

- mean duration of insufficient work: 1.6
- median duration of insufficient work: 2.5
- mean preferred number of extra hours: 0.7

**7** The following is an example of the calculation of SEs where the use of a factor is required. Table 5 shows that the estimated number of male underemployed part-time workers was 171,800 with a median duration of insufficient work of 25 weeks. The SE of 171,800 can be calculated from table T1 (by interpolation) as 4,700. To convert this to an RSE we express the SE as a percentage of the estimate or  $4,700/171,800 = 2.7\%$ .

**8** The RSE of the estimate of median duration of insufficient work is calculated by multiplying this number (2.7%) by the appropriate factor shown in paragraph 6 (in this case 2.5):  $2.7 \times 2.5 = 6.8\%$ . The SE of this estimate of median duration of insufficient work is therefore 6.8% of 25, i.e. about 2 (rounded to the nearest whole week). Therefore, there are two chances in three that the median duration of insufficient work for males that would have been obtained if all dwellings had been included in the survey would have been within the range 23-27 weeks, and about 19 chances in 20 that it would have been within the range 21-29 weeks.

## PROPORTIONS AND PERCENTAGES

**9** Proportions and percentages formed from the ratio of two estimates are also subject to sampling errors. The size of the error depends on the accuracy of both the numerator and the denominator. A formula to approximate the RSE of a proportion is given below. This formula is only valid when x is a subset of y.

$$RSE\left(\frac{x}{y}\right) = \sqrt{[RSE(x)]^2 + [RSE(y)]^2}$$

**10** Considering the example from paragraph 3, of the 300,300 female underemployed part-time workers, 104,200 or 34.7% had insufficient work for 52 weeks and over. The SE of 104,200 may be calculated by interpolation as 3,900. To convert this to an RSE we express the SE as a percentage of the estimate, or 3,900/104,200 = 3.7%. The SE for 300,300 was calculated previously as 6,000, which converted to an RSE is 6,000/300,300 = 2.0%. Applying the above formula, the RSE of the proportion is:

$$RSE = \sqrt{(3.7)^2 - (2.0)^2} = 3.1\%$$

**11** Therefore, the SE for the proportion of females who have a current period of insufficient work of 52 weeks or more is 1.1 percentage points  $(=(34.7/100) \times 3.1)$ . Therefore, there are about two chances in three that the proportion of females who have a current period of insufficient work of 52 weeks or more was between 33.6% and 35.8% and 19 chances in 20 that the proportion is within the range 32.5% to 36.9%.

## DIFFERENCES

**12** Published estimates may also be used to calculate the difference between two survey estimates (of numbers or percentages). Such an estimate is subject to sampling error. The sampling error of the difference between two estimates depends on their SEs and the relationship (correlation) between them. An approximate SE of the difference between two estimates (x-y) may be calculated by the following formula:

$$SE(x-y) = \sqrt{[SE(x)]^2 + [SE(y)]^2}$$

**13** While this formula will only be exact for differences between separate and uncorrelated characteristics or subpopulations, it is expected to provide a good approximation for all differences likely to be of interest in this publication.

## STANDARD ERRORS

### T1 STANDARD ERRORS OF ESTIMATES

Size of estimate (persons)	NSW no.	Vic. no.	Qld. no.	SA no.	WA no.	Tas. no.	NT no.	ACT no.	Australia no.	%
100	270	260	190	160	180	100	110	90	100	100.0
200	360	340	280	210	240	150	160	140	170	85.0
300	430	400	340	250	280	180	210	180	240	80.0
500	530	490	440	310	340	220	270	230	340	68.0
700	610	550	510	350	390	250	310	260	430	61.4
1,000	700	640	590	400	450	290	360	290	550	55.0
1,500	830	740	700	470	520	340	420	310	700	46.7
2,000	930	830	790	530	580	370	470	330	830	41.5
2,500	1 000	900	850	550	650	400	500	350	950	38.0
3,000	1 100	950	900	600	700	400	550	350	1 050	35.0
3,500	1 150	1 050	1 000	650	700	450	550	400	1 100	31.4
4,000	1 200	1 100	1 050	700	750	450	600	400	1 200	30.0
5,000	1 300	1 150	1 100	750	800	500	650	450	1 350	27.0
7,000	1 500	1 350	1 250	850	950	550	800	500	1 550	22.1

10,000	1 700	1 500	1 400	950	1 050	650	1 000	600	1 800	18.0
15,000	2 000	1 750	1 550	1 100	1 200	800	1 350	700	2 100	14.0
20,000	2 200	1 950	1 700	1 200	1 350	900	1 750	850	2 300	11.5
30,000	2 550	2 250	1 950	1 400	1 550	1 150	2 400	1 050	2 600	8.7
40,000	2 850	2 500	2 200	1 600	1 700	1 400	3 050	1 250	2 850	7.1
50,000	3 100	2 750	2 400	1 800	1 900	1 600	3 650	1 450	3 050	6.1
100,000	3 950	3 550	3 250	2 700	2 750	2 250	6 350	1 900	3 850	3.9
150,000	4 600	4 350	4 000	3 450	3 650	2 700	..	2 150	4 500	3.0
200,000	5 300	5 050	4 700	4 050	4 400	3 000	..	2 300	5 050	2.5
300,000	6 700	6 500	5 950	5 000	5 500	3 450	..	..	5 950	2.0
500,000	9 350	9 000	8 050	6 250	7 000	..	..	..	7 500	1.5
1,000,000	13 900	13 700	11 500	8 000	8 950	..	..	..	10 550	1.1
2,000,000	18 750	20 250	15 450	..	10 350	..	..	..	15 300	0.8
5,000,000	23 900	32 400	20 850	..	..	..	..	..	25 550	0.5
10,000,000	..	..	..	..	..	..	..	..	34 100	0.3
15,000,000	..	..	..	..	..	..	..	..	38 500	0.3

.. not applicable

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